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The sources of the river Mr. Andersson learned were 20 days' journey to the N.N.W. (probably 150 to 200 miles), and this would considerably contract the limits assigned to the probable course of the Cunēnē River.

Worn out with toil and fever, Mr. Andersson was eventually relieved by the generous exertions of Mr. Frederick Green, and for some years after resided at Otjimbenque, where his home imparted an air of civilisation and even of refinement to the village he had established.

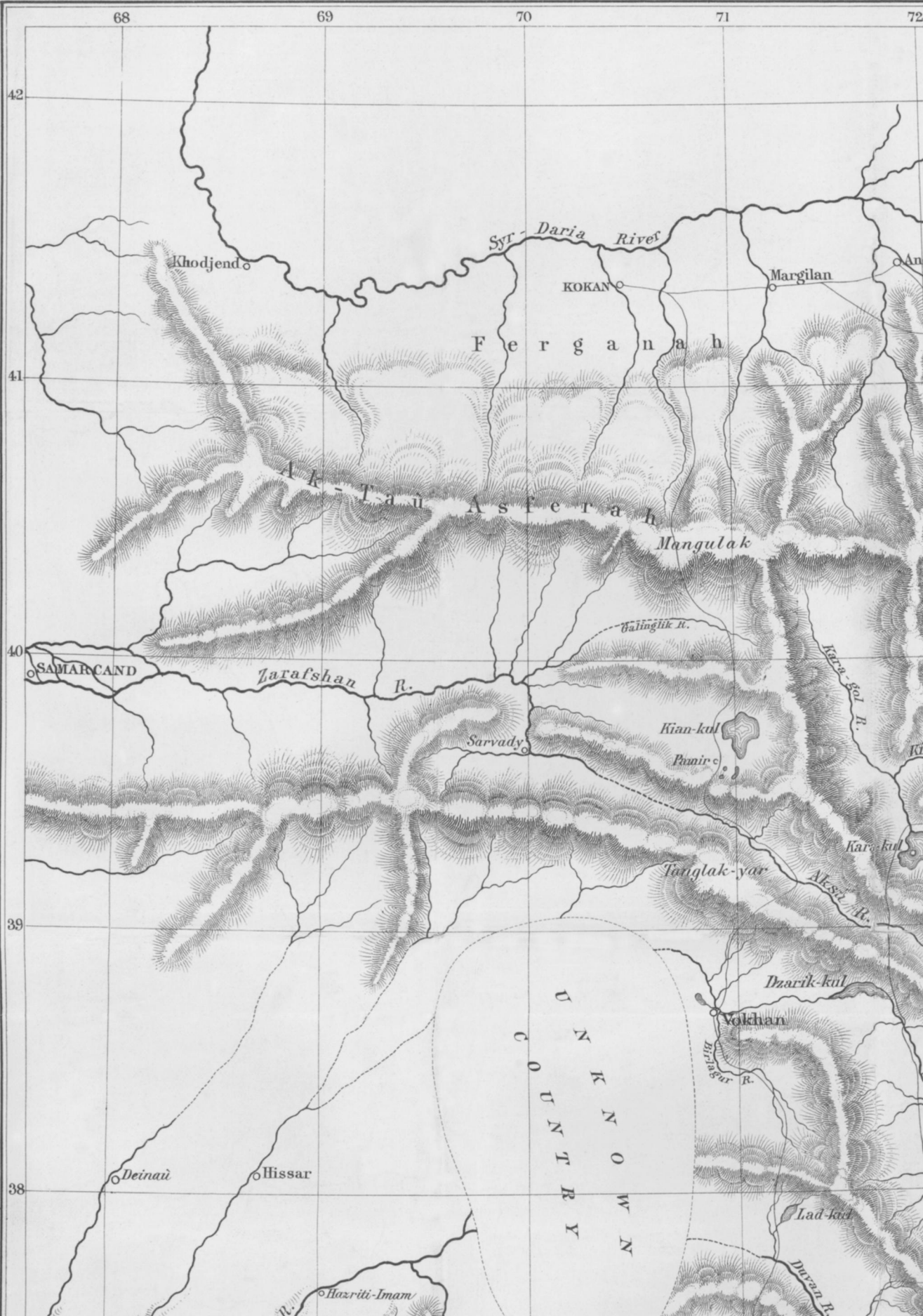
Mr. F. Green has since succeeded in reaching the Cunēnē River from Damara Land, in July, 1865, 170 miles W.N.W. from Ondonga. It surpassed the Okavango in the beauty of its scenery; the latter flowed clear and dark-blue like the sea, through a level country with low banks, bordered by reeds or corn-fields, and with comparatively few trees; but the Cunēnē, somewhat turbid from the soil it passed over, glided smooth as mirror between forest-clad banks—the trees, especially when islands divided the stream, over-arching and sometimes nearly meeting across it.

Mr. Green supposes the Okavango and the Cunēnē to have a common source in the marshes of the elevated plain of the interior; but the Cunēnē, then running about $2\frac{1}{2}$ miles an hour, and occasionally rising as the flood-marks showed 15 or 20 feet higher, soon reached the mountain-gorges to the W.S.W., down which it must rush with greatly accelerated velocity. He reached a spot only 15 days' journey distant from Mossamedes or Little Fish Bay; but he did not risk the descent with waggons through so mountainous a country.

XIX.—*The Pamir and the Sources of the Amu-Daria.* By M. VENIUKOF. Translated, for the Royal Geographical Society, from the 'Journal of the Imperial Geographical Society of St. Petersburg, 1861,' by J. MICHELL, Esq.*

IT has been very truly observed that the surface of the moon is better known to us than many parts of our own planet. Of this fact we may be easily convinced by comparing Behr and Medler's admirable map, or some of the clear photographs of the moon with the delineation of some parts of our globe. Science freely penetrates into the distant expanses of the heavens, but meets with insuperable obstacles to its progress on earth, where

* This and the following (Art. XX.) are the memoirs discussed by General Sir Henry Rawlinson, in his discourse on the travels of Georg Ludwig von —, published in the 'Proceedings,' vol. x. p. 134 *et seq.* See also Letters of M. Khanikof, Extracts from the Journal of Georg Ludwig von —, and Observations by Lord Strangford, 'Proceedings,' vol. x. p. 301 *et seq.*

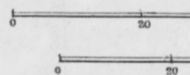


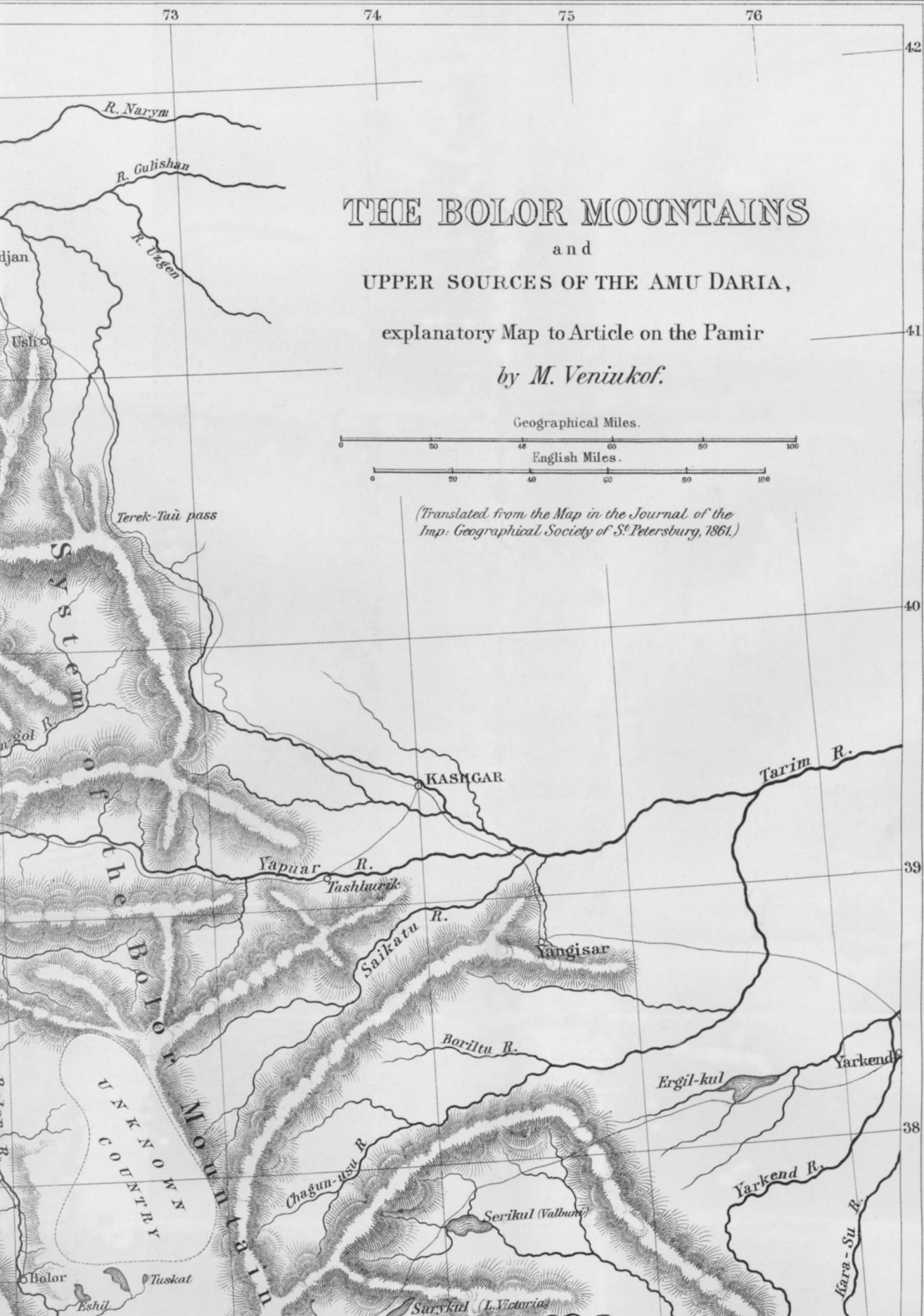


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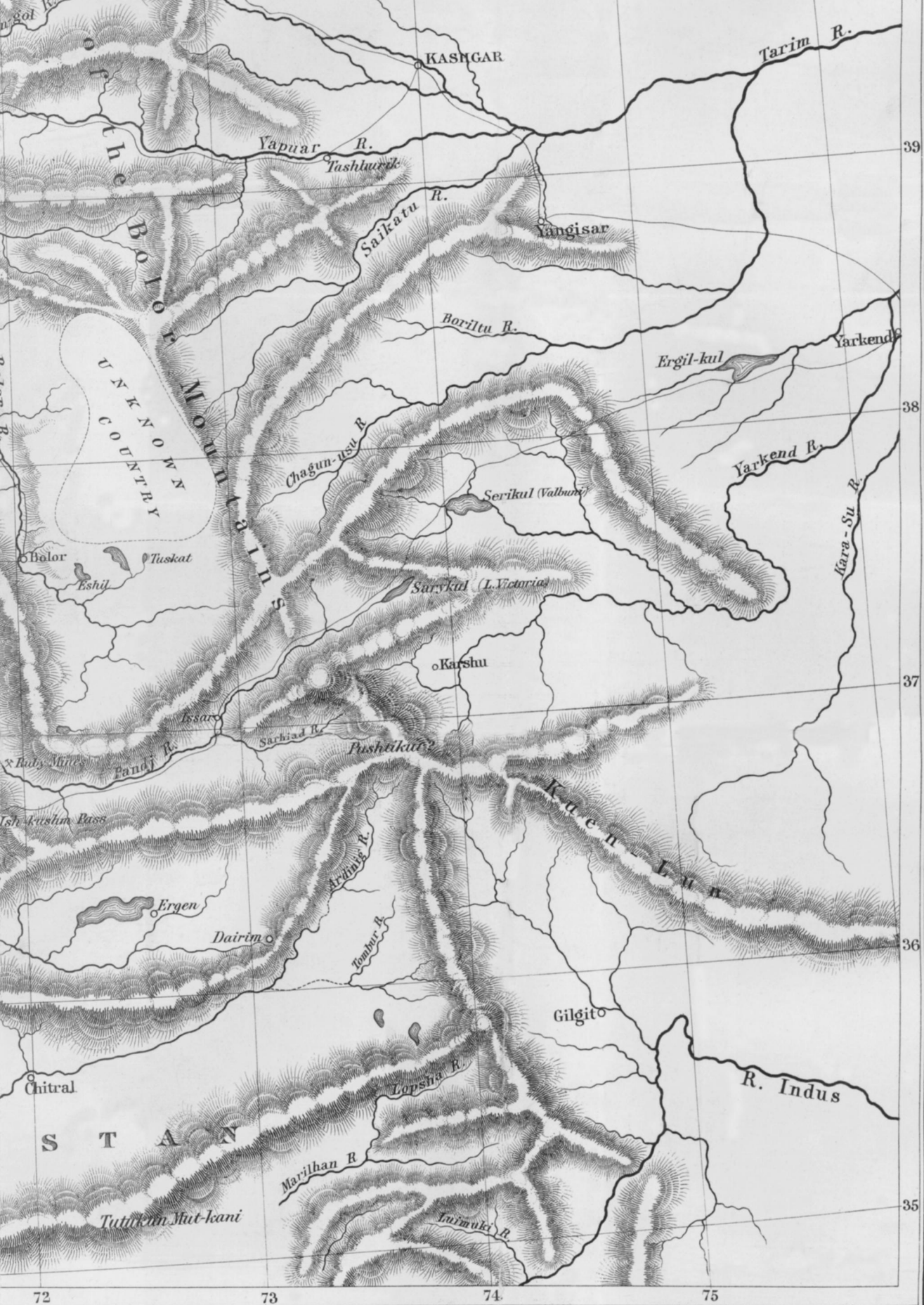
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the enmity of human races often renders whole regions inaccessible. The table-land of the Pamir, the Bolor Range, and the sources of the Oxus, are localities which answer to this description. From the sources of the river Koshkar, the extreme point of Russian survey, to Peshawur and the adjacent country under British dominion, the distance is not above 600 geographical miles, *i.e.*, a smaller interval of space than that existing between St. Petersburg and Warsaw; and yet we do not see the slightest prospect of the geography of this region being cleared up. The political condition of the inhabitants of both slopes of the Bolor is too hostile to be favourable to the peaceful aspirations of geography, and it is only by the thunder of artillery that the geographical gloom which envelopes the extensive uplands of inner Asia may successfully be dissipated.

An attempt on my part to elucidate the geography of a region to which even Ritter and Humboldt could give no distinct delineation would appear an act of unpardonable temerity. One circumstance will, I hope, exonerate me from any imputation of boldness. In the spring of 1859, when preparing to start on one of my expeditions into the interior of Asia, I chanced by good fortune to light on two very important sources of information relative to the geography of the Bolor, the existence of which has apparently been unknown to European and to our own native geographers. With the assistance of these new materials we shall, I hope, be able partly to unravel that gordian knot of geography which twenty years ago formed the subject of a paper contributed by one of our travellers, Mr. P. Chihachef, to the *Memoirs of our Society*. Before describing the new sources of information discovered by me, I shall first make an extract from Humboldt's '*Asie Centrale*,' with reference to the Bolor, in order that it may be more clearly seen in what the principal geographical questions relating to this region really consist, and to what extent the newly discovered materials are able to supply answers to them. As was truly said by the great Arago, a question properly put is already half solved; and where is this question of the Pamir more clearly set forth than in the pages of Humboldt's classical work?

"The chain of the Bolor, particularly that portion of it which chiefly bears this appellation, and is situated between 36° and 40½° lat., forms at present the natural boundary of China on the west. Commencing from the Terek-taù and the Tian-shan, or from the Pamir plateau to Badakhshan, colossal mountain ranges present insurmountable difficulties to the passage of military forces. Twice only—that is, once during the Han dynasty, contemporary with the Roman Republic and Tiberius, and once during the Han dynasty, coeval with the reign of Charlemagne—were the efforts of the Chinese to penetrate into the fertile valleys of the Oxus and Jaxartes crowned with success.* More

* Towards the latter part of the last century the Chinese were also masters of the Bolor and Badakhshan, though not for long.

than a hundred years before our era, during the reign of the Emperor Vu-di, at the time of the wars with the Huing-nu, Ferganah became a Chinese conquest, and remained in that condition for some time. The diminution in height of the Bolor at its northern point of prolongation, and after its intersection by the Asferah range, renders the passage from little Bukhara into Kokan comparatively easy.

"The etymology of the word Bolor, varied also into Belur, is as unsettled as that of the greater part of the mountain chains and large rivers. . . . The town and kingdom of Bolor, at the sources of the Oxus, are of ancient date. In the year 640 B.C. the Buddhist traveller Huen-Tsan says: 'To the south of the Pamir valley, after crossing a mountain, one reaches the kingdom of Bo-lo-lo, which produces much gold and silver.'"

This allusion to the wealth of the Bolor serves to explain the discovery of auriferous sand in the Oxus, although Humboldt is of opinion that the birthplace of the gold is on the eastern slope of the range.* Even in the middle of the eighteenth century, during the reign of the Emperor Tsian-lun, the Jesuit Felix D'Arocha placed the Bolor (Po-lo-euth) as one of the points on the list of his astronomical determinations. There is also a river called the Bolor, which after a curving course through Vokhan becomes one of the sources of the Jihun.

"The appellation of the Tsun-lin, or Onion Mountains, belongs properly to the intersection of the Bolor and Kuen-lun ranges, and particularly to the northern and eastern portions of the mountain knot. The Chinese, however, extend this designation not only to the whole of the Bolor, but also to the eastern part of the Hindu-Kush. Huen-tsan, for instance, applies the name of Bolor to the town and kingdom, while he calls the mountain chain Tsun-lin. The Buddhist priest Fa-hian, the predecessor of Huen-tsan by 240 years, and the author of the Foe-kue-ki, only passed through the southern part of the Bolor when proceeding from Kokan to Ladakh. 'The kingdom of Ladakh,' he says, 'lies amidst the Tsun-lin Mountains.' It is supposed that he speaks here of a part of Baltistan, generally called little Thibet.

"The uninterrupted prolongation of the meridional chain of the Bolor commences from the parallel of $32\frac{1}{2}^{\circ}$ to the south of its intersection by the Himalayas, Kuen-lun, and Hindu-Kush, to $45\frac{1}{2}^{\circ}$ on the north of its intersection by the Tian-shan, which range here respectively receives the names of Asferah, Kipchak, and Terek-Tau. The chain thus extends over a distance of 860 miles (1300 versts). The dominating points probably rise above 18,000 feet, and are situated between 35° and 40° lat., occurring particularly at the knots, with the ranges extending parallel with the equator. The southern knot especially is of colossal proportions both in breadth and relative altitude. The wonderful labours of Elphinstone and Burnes, in conjunction with the daring explorations of Lieut. Wood and Dr. Lord, have made us acquainted with this region of marvels.

"The extension of the Bolor chain, and its range from north to south, were well known to the traveller Huen-tsan. He asserts with great distinctness that 'the Tsun-lin Mountains abut on the south on the great snowy range (the Hindu-Kush), and reach on the north the Warm Sea (Issyk-kul) and the Thousand Springs, or Min-Bulak.' The addition of this latter remark would apparently establish the continuity of the range to the sources of the Kazyurt, which intersects Minbulak and the Kendyrtau range. In order to fix the

* Allusion to one of these birthplaces of gold will be made hereafter.

direction of the axis of the Bolor I was obliged to rest this axis eastward on Kashgar and Yarkent, and westward on Cabul, Bukhara, Kokan, and Tashkent. The accuracy of these astronomical positions is very unequal, and the danger of error is all the greater, inasmuch as we have to deal not with a chain that runs parallel to the equator as the Tian-shan, where the latitudes are of moment, but with a meridional range, the determination of the position of which will be greatly influenced by errors in the longitudes. In the greater portion of the recent maps of Asia the results obtained and published by Father Felix D'Arocha are to a great extent disregarded, even in the matter of longitudes. It is my opinion that in the advance of new astronomical determinations in this region the old points must be adhered to."

By comparing various data, Humboldt arrived at the conclusion that the axis of the Bolor forms with the meridian an angle of $9^{\circ} 16''$ to the west, and that its position through the parallel of $32\frac{1}{3}^{\circ}$ may be fixed in longitude $91^{\circ} 50'$ E. of Ferro; through parallel 40° in long. $89\frac{3}{4}^{\circ}$, and through parallel 44° in long. $89^{\circ} 25'$, where the Kaz yurt terminates.

"The chain of the Bolor, like the greater part of all long ranges, consists of smaller parallel chains divided from each other by high valleys and plateaux. This fact is established by the details of the description of the three great passes through the Bolor. The most northern of these passes leads from Yarkend and Kashgar to Kokan. Caravans laden with tea, destined for the market of Bukhara, leave the region watered by the tributaries of lake Lob-nor and cross two mountain chains before reaching the basin of the Syr-Daria and the Aral Sea. The first mountain pass on this difficult route, which runs from south-east to north-west, occurs at that portion of the Celestial Mountains called the Terek-tah. This is the Kashgar-davan pass, which many geographers have converted into a mountain chain. After clearing this first barrier, which runs from east to west, caravans proceed through the northern prolongation of the Bolor, between Ush and Andidjan, which is situated on the left bank of the Syr-Daria. This route from Bactriana beyond the Imaus through the 'stone tower' was known at a remote period. We are able to trace this route by two march-routes of a recent period." [The march-route of Mir-Isset-Ulla, from Kashgar to Kokan, *Klaproth*, 'Mag. Asiatique,' t. ii., and a Russian march-route from Tashkent to Kashgar, placed at Humboldt's disposal by Count Cankreen.] "Beyond this pass southward there is the Pamir pass, which extends through a continuation of the Bolor to the north of its intersection by the Asferah range, approximately in lat. $41\frac{1}{2}^{\circ}$ ($37\frac{1}{2}^{\circ}$ — $32^{\circ} 5'$?). The next pass is that which was traversed by Father Goetz, in 1603, when proceeding from Karshu through Sirkul and Yarkend. Ritter was the first to direct attention to the route of the Jesuit missionary from Karshu, which lies—if we adopt as a basis Lieut. Wood's observations on the sources of the Oxus—approximately in latitude $37^{\circ} 10'$. The Pamir Pass—a description of which is extant from the 6th century—is the most celebrated in the whole of the Bolor Mountains. The division of the range into subsidiary chains becomes visible here in the difference of climate and form of vegetation; and this division is so apparent that Macartney, in his beautiful map attached to Elphinstone's journey, distinguishes the chains of the Pamir, Bolor, and Badakhshan. The Buddhist traveller, Son-Yun, who crossed the Bolor in a direction from east to west after leaving Khotan, speaks of two chains, the eastern of which he calls the Great Tsun-Lin.

"It now remains for me," continues Humboldt, "after giving a general sketch of the Bolor, to dwell more particularly on the principal mountain heights of the region. It is only impossible to say whether these elevated points rise

immediately out of the range or whether they occur at the side of it. Between Gilgit and Chitral, that is between the intersections of the southern and northern Hindu-Kush, rises the colossal peak of Tutukan, which, judging from the angles of elevation from some distances, is not less than 3200 toises in height (according to Elphinstone); this peak occurs in the eastern part of the Bolor, in latitude $35^{\circ} 25'$. One degree northward of this peak, and nearly under latitude 37° , between Karshu and Vokhan, is the Pushtekhar group,* which extends from s.s.e. to n.n.w.; but however colossal this group may appear, it forms only the girdle of an upheaval still higher, known under the name of the Pamir, and celebrated throughout the whole of Central Asia as a mountain to which all other snow-capped mountains must in comparison be considered low."

Turning then to descriptions of the Pamir, Humboldt alludes to the observations of Burnouf, and to Neuemann's translation of 'Son-Yun,' citing then Huen-tsan, who says:—

"The Pamir Plain extends 1000 li from east to west and 100 li from south to north; it is situated between two snowy mountains. Grain is sown there, but everything grows badly. In the middle of the plain is the Dragon's Lake, the waters of which are dark green, and full of tortoises, sharks, crocodiles, and dragons. Foxes, swans, and wild ducks frequent these waters. To the west of Dragon's Lake† there issues a large torrent which flows towards the Oxus; another torrent, which flows towards Kashgar, issues out of the lake on the east. To the south of the Pamir Plain, after crossing the mountain, lies the kingdom of Bolor, where much gold and silver are procured."

In the interval between Huen-tsan and Wood (1838), the only traveller who visited these parts was Marco Polo. This enterprising man may have crossed over the Pamir in 1277, but it is difficult to ascertain from the account he gives whether he did actually traverse the plateau. From the phrase "it is said," which he uses in his description of the Pamir, it must be concluded that he did not visit this locality himself. He was detained by illness a whole year at Badakhshan, and from this place he might easily have reached Kashgar by crossing the Bolor in a more southerly direction than that followed by Father Goez. In every case his description of the Pamir is exactly similar to that given by Huen-tsan and Wood; the latter especially coincides with him in the smallest details.

"Proceeding from Badakhshan to the north-east and east," says Marco Polo, "one reaches, after passing several small castles along the bank of one river, the province of Vokhan, the inhabitants of which profess Islamism. Journeying three days more in an easterly and a north-easterly direction one arrives after a prolonged ascent at the summit of a range of mountains which they say are '*il piu alto luogo del mondo.*' When the traveller finds himself in this place he sees between two mountains a large lake, out of which issues a fine river. The plain yields such fine pasturage that the leanest cattle get fat in ten days."

In these mountains Marco Polo did not see any birds, whereas

* Vide Addenda, I.

† Ibid., II.

Wood says that the lake was covered with them, which agrees with the account of Huen-tsan.

"In spite, however, of the striking similarity, topographical and physical, between the accounts of Son-Yun (518), Huen-tsan (629-645), Marco Polo (1277), and Lieutenant Wood (1838), the geographer seeking to ascertain the position of a point is never sure of the identity of any locality. He is at a loss to know whether the designation of the Pamir belongs exclusively to one plain, which Huen-tsan calls P'o-mi-lo, or to the whole of the extensive plateau taking twelve days to cross, as stated by Marco Polo. The Venetian traveller, like Huen-tsan, says at the end of his description that to the south of the Pamir is 'Belora,' but he does not mention that the plateau of the Pamir forms the water-parting between the basins of the Oxus and Lob-Nor. Marco Polo visited the province of Vokhan, and it is surprising that he did not learn that the 'fine river' flowing out of the alpine lake was the Oxus, the same river that forms the limit of Vokhan, on the north. The western extremity of Sary-kul Lake, which is one of the sources of the Oxus, is situated, according to Wood, in lat. $37^{\circ} 27'$, and long. $91^{\circ} 20' E.$ of Ferro. According to the accounts gathered by Macartney during Elphinstone's memorable expedition, two other lakes exist in the zone of the Pamir, namely, Kara-kul, in lat. $38^{\circ} 50'$, and Surik-kul, in lat. $39^{\circ} 10'$, marked on Macartney's map considerably to the northward of the principal source of the Oxus, which is placed in lat. $38^{\circ} 10'$. Macartney shows no outlets from these lakes, situated, one $1^{\circ} 23'$, and the other $1^{\circ} 43'$ to the north of the Sary-kul of Wood. The excellent map of John Arrowsmith, constructed in 1834 for the work of Alexander Burnes, does not altogether agree with the statements respecting the Pamir in the text of Burnes' work. 'The centre of the plateau,' says Burnes, 'is Saryk-kul, out of which there should issue, according to all accounts, the Jaxartes, Oxus, and a branch of the Indus. This plateau, which affords excellent pasturage, extends round the lake for a distance of six days' journey in circumference; and it is said that from this elevation all the adjacent hills appear below the observer.'

"Arrowsmith's map shows also, in lat. $38^{\circ} 40'$, Lake Dzarik-kul, doubtless the Surik-kul of Burnes' narrative; it is represented as one of the sources of the Oxus (Vokhan River), and as a basin rather elongated from north to east, somewhat resembling the Sary-kul of Lieutenant Wood. But the latter lake is situated $1^{\circ} 13'$ more southward of Dzarik-kul of Arrowsmith's first map.

"On the same map, to the north-east of Dzarik-kul, in lat. $38^{\circ} 56'$, there appears the much larger lake of Kara-kul, out of which flows, on the east (*vide* Klaproth's map), the River Tashbalyk, also called the Yaman-Daria, and which lower down receives first the names of the Kashgar-Daria, and then that of the Tarym. Lastly, still more northward of Kara-kul, Arrowsmith's map shows a third alpine lake—that of Rian-kul ($39^{\circ} 18'$).

"All these considerations tend to show that a similar liability to that previously observed by me in my researches into the geography of the New World exists also here, namely, the liability not only to transfer the same points to the north and south, but also to confound proper names together. On Macartney's map Surik-kul is placed more northward than Kara-kul, while on Arrowsmith's it appears more southward. Zimmermann inserts both Dzarik-kul and Kara-kul lakes almost in the same parallel of 39° on the Pamir Plain, and shows one of the branches of the Oxus (the Fatsu) as emanating from Dzarik-kul in a direction from north to south. But the lake visited by Wood discharges another branch (Düra-Sary-kul) in a direction from east to west (this branch flows to the southward of the celebrated ruby mines). The very name of Sary-kul (Dzaryk-kul) has become a prolific source of error. Besides a lake or lakes of this name, there are many inhabited places west and east of

the Bolor which bear the same appellation, though their situation differs considerably in point of latitude.

"Although the position of the Pamir in connexion with the astronomically fixed lake of Saryk-kul ($37^{\circ} 27'$) becomes determinable, the plateau itself is not nevertheless uniformly inserted on all maps. Macartney's position for the Pamir is between $38^{\circ} 10' - 39^{\circ} 5'$; Baldelli's $30^{\circ} - 40^{\circ}$; Klaproth's $39^{\circ} 36'$; Arrowsmith's (on his map to Burnes' work) $38^{\circ} 40' - 39^{\circ} 55'$; Ritter's $39^{\circ} 31'$; Arrowsmith's (map to Wood's work) $37\frac{1}{2} - 38^{\circ}$; Zimmermann's $39^{\circ} - 39^{\circ} 5'$. When the 'Bombay Gazette' gave the first accounts of Wood's journey to the sources of the Oxus, to Lake Sary-kul, and to the plateau 15,000 feet high, it was imagined that this dauntless explorer was much more to the southward of the region of the Pamir proper than he actually was. For some time I also shared this supposition. But the publication of Wood's valuable work soon dissipated my doubts respecting the identity of the Pamir with the neighbourhood of the Sary-kul. The traveller was surrounded by those Kirghizes who give themselves out as masters of the whole of the Pamir. When at the point of junction of the two branches of the Upper Oxus, at Issar ($37^{\circ} 2'$), Wood being in uncertainty as to which route he should follow, heard that the northern branch was called the Pamir branch. The Pamir was described to him by the Kirghizes as a high alpine region, which might very properly include the lakes of Rian-kul and Kara-kul, in latitude 39° . These Kirghizes stated in a very positive manner 'that Lake Sary-kul was situated on the roof of the world, and that this roof was the Pamir.' The road along which Wood ascended to Sary-kul is the caravan-road to Yarkend. It is to be regretted that the traveller does not state which part of the Pamir is called the Little Pamir.

"The Oxus is formed, like many other large rivers, by the junction of several branches, so that we may set aside the doubt respecting the lake which, according to Pliny, forms its veritable source. But is the Sary-kul of Wood the Dragon's Lake of Son-Yun and Huen-tsan? The route of the first of these Buddhist travellers, who started from Tashbalyk ($39^{\circ} 10'$), runs, according to the Chinese text, not from south to west, but due west, and does not apparently approach lat. $37^{\circ} 27'$. At the same time, however, the fable of the dragon is identical in the accounts of Son-Yun and Huen-tsan, and the latter it appears proceeded in a north-east direction, which might lead to Sary-kul. It is not so easy to see how, travelling south towards the Bolor, where there is much gold, the traveller could reach Tashbalyk. It would be necessary to presuppose the Ko-panto kingdom, which extends further eastward than the Bolor, as being situated far to the south."

These are the words of the great natural philosopher to whom the geography of Central Asia owes its foundation. It is not difficult to see what Humboldt still required, in order that his clear mind might present the same definite and lucid picture of the Bolor and sources of the Oxus as he drew of the Andes, or the general features of the orography of Asia. He had no evidence connecting in an unbroken chain the fragmentary statements of travellers. The Bolor and the Highland of the Pamir were considered as being unvisited by a single traveller along a route from north to south. The chaos of geographical accounts respecting this region was so great that Zimmermann, the celebrated geographer of Berlin, could, even when working under the guidance of Ritter himself, only produce a very con-

fused and unintelligible map. It was to be expected that the connecting-link would be discovered, that is, that some one would undertake to realise the scheme which had been contemplated by the Russian Government during the early part of this century. Very fortunately such a necessary source of information respecting the geography of High Asia has been discovered, irrespective of the long-neglected expeditionary project; nay, we possess two new sources of information which mutually corroborate and amplify each other, although they have nothing in common in regard to their compilation.

I here allude to the 'Travels through Upper Asia from Kashgar, Tashbalyk, Bolor, Badakhshan, Vokhan, Kokan, Turkestan, to the Kirghiz Steppe, and back to Cashmere, through Samarcand and Yarkend;' and to the Chinese itinerary translated by Klaproth in 1821, leading from Kashgar to Yarkend, Northern India, Dairim, Yabtuar, Badakhshan, Bolor, Vokhan, and Kokan, as far as Karatau Mountains. The enumeration alone of these places must, I should imagine, excite the irresistible curiosity of all who have made the geography of Asia their study. These fresh sources of information are truly of the highest importance. As regards the 'Travels,' it is to be inferred from the Preface, and from certain observations in the narrative, that the author was a German, an agent of the East India Company, despatched in the beginning of this, or at the latter part of the last century, to purchase horses for the British army. The original account forms a magnificent manuscript work in the German language, accompanied by forty sketch-maps of the country traversed. The text has also been translated into French in a separate manuscript, and the maps worked into one itinerary in admirable style. The Christian name of this traveller, Georg Ludwig von —, appears over the preface, but the surname has been erased. Klaproth's itinerary is so far valuable as the physical details are extremely circumstantial; almost every mountain is laid down, and care taken to indicate whether it is wooded or snow-capped; while equal care is taken to show whether the inhabitants are nomads or a stationary people. Ruins, bridges, and villages are also intelligibly designated, so that although the same scale is not preserved throughout, its value, lucidity, and minuteness, are not thereby deteriorated. Without entering into details respecting these materials, the first of which is especially deserving of wide publicity, I shall proceed to give extracts from that portion of the 'Travels' which relates immediately to the Bolor and the surrounding region.

"The road from Kashgar to Tashburik leads through well-cultivated fields and highlands, which stretch as far as the Altyn-tag Mountains. At the period when Kashgar was governed by its own princes, gold to the value of more

than 180,000 ducats was yearly extracted from the mines of these mountains. But the Chinese Government have filled up all the old mines and workings, and even flooded those parts of the country where mines might be opened. Moreover, all the neighbouring heights are guarded by Kalmyk pickets. The working of these mines must be very easy, and according to some local particulars given me by the Armenian Guka, no shafts in all probability were ever sunk here, nor levels dreamed of. In the possession of my friend I saw a specimen of quartz as large as a man's fist, of a dark brown colour, and intersected with veins of gold. Guka valued this specimen at 40 ducats. Gold-yielding sand is also found in Gumri rivulet, which flows eastward from the above mountains to the River Kashgar. On the following day I joined a caravan which was halting at Tashburik in expectation of some loads of rhubarb, a great quantity of which is exported from hence into Persia.

"On the 21st of June we crossed the Yapuar River, which flows past the town, and spent the night in a good caravansari, near which the Taktabash rivulet, falling into the Yapuar from a rock 300 feet high, forms a fine cascade, and appears to be lost in spray as it rushes down between the numerous crags. The beauty of this scene was enhanced by the splendour of the sun, which formed a double rainbow in the misty vapour. Our second night-halt was at Ola rivulet, which also flows into the Yapuar, and which supplied us with some excellent trout.

"Farther westward the road led us uninterruptedly along the southern bank of the Yapuar, which descends in a continued series of cascades. This river issues out of the Lake Kara-kul and flows eastward through a valley bordered by high hills. This valley is very fertile, and the pastures of its meadows, on which the herds of the pastoral Burut-Bolsa tribe were browsing, is remarkably rich."

This is the same route that was followed by Son-Yun in proceeding to Dragon's Lake.

"As we ascended the Yapuar the country became wilder and the air colder. The high Chahar-Aller Mountains rose on the north, while on the north-west appeared the summit of the Tengri-Tiub, partly lost in the clouds. After the Himalayas this was the highest mountain that I had seen.* At the distance of about one agatch from whence the Yapuar issues out of Kara-kul Lake, we crossed from the right bank to the left, and proceeded towards the lake, to the point at which the Katun rivulet falls into it.

"On the 24th of June we continued our journey along the northern shore of Kara-kul; but soon after midday a storm, accompanied by a drift of fine snow, compelled us to halt and pass the night at the foot of the Alalyk Mountains. On the following day the storm subsided. The water of the lake is of a dark colour, and during the continuance of the storm the waves breaking on the rocky shores produced a great noise. According to the statements of the Buruts who accompanied me, the lake contains plenty of fish. On an island in the centre of it there must be a warm spring emitting strong sulphurous fumes, as native sulphur is found close by in the form of crystals, which the Buruts collect and bring in great quantities to the market of Kashgar. There is also a kind of sulphurous mud which is used with success for mange in horses.

"About ten years ago a battle took place near Alalyk and Ulyatch moun-

* It is also here, on the meridian of Ush and Andijan and a little southward of these places, that the Kirghizes and Turkistanis, who visited Ferganeh, placed the highest points in Central Asia. They gave the name of the *Alai* to the whole of this elevated mass, under which designation the Bolor range is sometimes comprised.—*Note of M. Veniukof.*

tains between the Chinese and the Belors, which terminated in the overthrow and subjection of the latter. On the 26th of June we halted in the defile where the battle was fought; this defile is the real key to all the countries lying to the eastward, as all the roads leading from the west unite at a short distance beyond it. The natural strength of the pass is so great that a single redoubt with two batteries and a garrison of 500 or 600 men might hold a strong army at check, as the hills on the right and left are inaccessible to cavalry and artillery, and the narrow pathways would with difficulty be traversed by infantry.

"It is incomprehensible why the former inhabitants of this region when building the fortifications, of which the ruins are still visible to the south of the defile, did not fortify the pass itself, which might have been done with very little trouble. They built an excellent stone bridge over the Aksu, consisting of one arch of considerable span. We passed the night on a high spot, at about half an agatch to the south of this bridge. The rapid Pana torrent takes its rise here and flows through a deep and rocky defile towards the river Bolor. Some nomads of the Chingir-Gerba tribe were at that time camping at its mouth, and we encountered many of these wanderers along the course of the river to the very town of Bolor. The whole of this deep and horror-inspiring valley is filled with large ruins, showing that at one time it was inhabited by a settled people. It is said that the capital of this people was situated at Koolit Mountain, along both banks of the Mingis rivulet, where extensive ruins are to be seen to the present day.

"After crossing the Kuzluk River we entered a dense forest called Kasbatir, which extends south-westward for 12 agatches, reaching to the borders of Badakhshan. I found a numerous horde of nomads on the right bank of the Bolor, and I remained among them several days purchasing horses, 980 of which I despatched to Kashgar. To the leader of these horses I entrusted two copies of the account of my journey and an equal number of sets of geographical maps, completed by me up to that period, in order to insure their safety.

"Between the mountains Asbulash and Elirator there is a very large mine of native cinnabar, which the Belors carry to Badakhshan and Kashgar in its native state and in the form of mercury. The yield from this mine amounts to 40,000 oz. of silver. While among the Belor-Oma nomads I tasted a very strong rectified spirit called telik-araki, which is distilled from some black berries resembling cherries.

"On the 3rd of July I reached the town of Bolor, and was well received, not only by the Chinese general, Kulingtu, but also by the Armenian trader Kurlak, to whom I was recommended by Guka. So successful was I in gaining the favour of the Governor by my praises of his victory, that he was much pleased with me, and requested me to remain some time longer with them at Bolor, on account of the great horse fair at Badakhshan, which would not be held until the end of August.

"On the 23rd of August I was at last able to leave Bolor. At about half an agatch from the town we crossed a rapid river, and proceeded across the mountains through a rocky and dangerous defile, after clearing which we passed through some others, called collectively Blakh. Two rivulets which flow through these defiles form the small river Namzir, which falls into the River Duvan,* through a narrow and deep gorge thickly clothed with trees. Near the Badakhshanian village of Falok a fine bridge leads across the Duvan River, but the Kaltan-Agatch Forest only comes to an end at Amin rivulet.

* This River Duvan is in all probability the branch of the Oxus which takes its rise in Lake Sary-kul.—*Note of M. Veniukof.*

“On the 25th of August I safely reached Badakhshan. This town is situated on the southern bank of the River Sharud, and inhabited by Mahometans, who are governed by a separate sultan, amenable, however, to the supreme authority of the Chinese. Although the Chinese garrison of this place is very small, the native ruler is, for many reasons, firmly attached to the Chinese Government, the principal being the great profit derived by his subjects from the conveyance of merchandize between Persia and Kashgar, which latter place has been subject to China since the establishment of the Chinese at Badakhshan. The district of Badakhshan is watered by the Duvan and Sharud, and is extremely fertile. Besides the trade in horses, cattle, leather, and leather manufactures, a considerable traffic is carried on in precious stones; such as rubies, sapphires, hyacinths, and a particular description of lapis-lazuli, which cannot be obtained anywhere else of such excellent quality and in such abundance.

“The beautiful plains which extend between the mountains are so fertile, that they can truly be called the granaries of this region, and they even supply rice and barley to many of the neighbouring countries. All the necessities of life for the poor are here found in abundance. The situation of the country is one of great strength, and the region is only approachable through five narrow defiles. The north-eastern defile through which I passed was defended at the village of Tur by a fortress and by some redoubts in the Namzir Valley; similar works of defence are erected in the other valleys. Whoever is ruler of Bolor and Badakhshan is in a position not only to dictate to the Chinese at Kashgar and Yarkend, but also is master of the road that leads to India. The fine camels possessed by the inhabitants are another source of riches to the country. These animals are very strong, have extraordinary powers of endurance, and carry loads of every description.

“After recovering from the fever under which I had suffered from the end of August to the latter part of January, I left Badakhshan in company with many travellers and traders who were taking goods to Vokhan. We proceeded northwards at first, and then bent our course to the west. Our first halt was at the village of Panirlik, situated close to Bol Lake, and justly celebrated for the excellence of the cheese that bears its name. The inhabitants carry on a lucrative trade in this cheese, which resembles the Dutch in taste. On the following day we made a journey of 12 agatch to Pirmahmud, a fortified village on the right bank of the Duvan, which at this place is very broad and rapid, and over which we crossed on the following day in broad ferry-boats. As far as Sulta the country is both fertile and pleasant in aspect; beyond that point, however, the mountains extend again across the face of the country.

“The road beyond brought us to Ladjul Lake; we then ascended a narrow and rocky valley, at the head of which, between Kartul and Jilak mountains, there is a very strong guard-house, which marks the frontier between Badakhshan and Vokhan. After ascending a broad mountain-slope we passed a ruined military post of Vokhan, situated on a very rocky eminence between the turbulent Ottichai and Kara-balyk rivulets. The latter receives its name from a small, though very delicious, fish caught in it. These two rivulets uniting together form the Birlagul mountain-torrent which rushes down in a narrow stream 400 paces below the guard-house, though a crevice 300 feet in length in the rock, which roofs in the torrent with its overhanging crags. Here also are to be seen the ruined fortifications and walls which at one period defended the entrance into the fertile Vokhan Valley. The four villages of Kishlak, Talkent, Imbirlar, and Testuta, occurring beyond this pass, are also fortified, but their inhabitants are very poor, and live on the produce of their herds and by the pursuit of agriculture. Their principal occupation, however, consists in collecting gold sand, along the Talsu and Endir rivulets. This

gold sand is found in abundance, and is gathered under the supervision of Altyn-Bashis and armed soldiers, who convey the gold to the ruler of Vokhan. The gold-seekers receive in compensation a small percentage on the gold found, which amounts yearly to the value of 42,000 to 48,000 ducats. Instead of being paid in gold, the labourers receive in satisfaction agricultural produce, and other necessities of life. The sale of gold is prohibited under punishment of death. Owing to this regulation we were accompanied by a convoy of eighteen armed men from Kishlak village as far as Vokhan, so as to prevent us holding any intercourse with the natives. I reached Vokhan on the 18th of April. The town is situated on the left bank of the Birlagul,* on a plain surrounded by a high wall, and containing as many as 7000 inhabitants, principally Mahometans. Malek-Shah-Bezurk, the ruler of the country, is under Chinese domination.

"There are several silver-mines on the opposite side of the Birlagul River and near Gumbot village, but they are not so rich as those at Urla, near Kur-takul Lake and at Nola, Vadig, and Sosna mountains, the last of these mines yielding 820,000 ounces of silver, as Malek-Shah-Bezurk assured me himself. With the exception of these mines the country is poor and mountainous to Kashgar, so that the greater part of the wants of the natives are supplied by Badakhshan and Kokan. The mountains abound in bears, foxes, lynx, badgers, elk, wild goats, and other animals, yielding good skins and furs. On the 3rd of May I left Vokhan, crossing the Birlagul, and following its course and that of the streams falling into it.

"After ascending the long and narrow valley of the Olbi rivulet, and reaching its source, we traversed the high and level summit of the Tanglak-Yar Mountains, which is several parsangs in breadth, and covered with ice and snow. The Terekchai rivulet, which is formed by the thawing of the ice and snow, flows in a continuous cascade through a ravine towards the Aksu, on the left bank of which we made a halt. This is the same river over which we crossed on the 27th June last year. Its borders are inhabited by the wandering Burut-Alis, who possess many horses and are under Chinese rule. A very fine description of lapis-lazuli is found at Tash-tal rivulet, and is eagerly sought after by Kokanian traders. After leaving behind us the source of this stream, we emerged on the snowy plateau of the *Pamir*, which is always swept by a very cold wind and rendered, in this manner, insupportable as a permanent place of habitation. The several lakes existing here are covered with ice all the year round, the surface of which is so smooth that the snow is always blown off by the wind. On descending northwards from the Pamir plateau, the traveller sees before him the large lake of Rian-kul (Lian-kul), in which the water is so cold that no fish are able to exist. To the north of this lake rise the icy summits of Taluk, Alaktag, Kichi-Alak, and Altyutash; our road lay between the two latter as far as the lower course of the Golinglu rivulet, which forms the boundary of Kokan.

* From Klaproth's translation of the march-route which leads to Vokhan, it is to be seen that the Vokhan River, an outlet of Lake Dzarik, and a continuation of the Bolor River, flows from the north-east to the town of Vokhan. In our traveller's narrative this river is not mentioned, and the Birlagul is continued north-westwards from Vokhan. Probably he did not see the junction of the two rivers under the walls of the town, and subsequently crossed over the united stream of both. It would be curious to know what Wood comprehends under the name of Vokhan,—whether it is the valley of the upper course of the Oxus, as Macartney represents it in his map, or merely the south-eastern extremity of the Vokhan territory? The latter supposition is the least probable, from the small geographical area of Vokhan. Most likely it is a proper name, like many others in Central Asia (Kara-kul, Aksu, &c.), which are applied at once to several localities.—*Note of M. Veniukof.*

"From this rivulet* we ascended northwards, and again crossed over the very cold Mangulat Plain. Beyond it we penetrated into the Kara-Agatch Mountains, which are thickly wooded, and afterwards descended to Koshlush rivulet at Ait-kent village. This was the first inhabited spot we had reached after leaving Vokhan. Here I had a severe attack of dysentery, and was confined to bed for four days. The principal pursuit of the natives of Ait-kent village consists in working the iron-ore which they obtain from Temir-Ura Mountain; they also manufacture steel of very good quality, and are very skillful gunsmiths. Near Gashikent we entered the luxuriant valley of Kokan covered with villages and fertile fields. Unfortunately I could not derive much enjoyment from this magnificent country, as I had hardly strength enough left in me to accomplish the journey to Kokan, which town I reached in a very sickly condition. My illness lasted for a whole year, so that during the whole of this period I was not able to keep up my diary. The short notes which I did make were lost on two separate occasions, when I met with accidents; my maps were alone saved by a miracle."

To this highly interesting information nothing can be added with respect to the Pamir, to Rian-kul, Kara-kul, Dragon's Lake, Dzarik-kul, the Bolor River, and Sary-kul Lake, visited by Wood. The map appended to this paper will illustrate the matter more clearly than any reflexions, a few of which, however, I have added at the end of the paper. I am much afraid of being rebuked for the boldness with which I have dotted the determined course of some rivers, and distributed the principal points on the map. Mention has already been made of Humboldt's recommendation as to the necessity of placing reliance on the determination of the Jesuits of the period of Tsian-Lun. I have adhered to these in inserting Kashgar, Tashburik, Yangisar, Yarkend, Karshu, Andijan, Kokan and Ush on my map. The same authorities have served me in assigning the position of Sary-kul ($37^{\circ} 48'$ lat., and $91^{\circ} 41'$ long. E. of Ferro), which our traveller calls Lake Valbuni, but of the identity of which there can be no doubt, judging from its configuration and position. As regards Vokhan and Bolor, included by D'Arocha in his list of astronomical points, I must be allowed to express some doubts as to the accuracy of their determination which, though they may be well known at Pekin, may not have reached us in an authentic form. Both these towns lie apparently north of parallels 38° and 37° , under which they are given in the "List" of Messrs. Tolstor and Khanikof. At all events this is as they come out according to our traveller's itinerary which may be easily laid down on the map along the whole journey from Kashgar to Badakhshan and thence to Kokan. The agreement of this new source with Kiepert's map of the *Turan* in *Ritter's Erdkunde*, the best in existence, with the accounts of Burnes and Khanikof's map (the Khanat of Bokhara) is so striking, that I considered it quite safe to take for instance

* Vide Addenda, IV.

the Aksu as the commencement of the Zarafshan, and the Duvan for the Dura-Sarykul of Lieut. Wood. Two spots remain marked "*terra incognita*" on the map,—namely the great plain to the west of Vokhan, where Karatigen and Darvaz should be situated, and which extends as far as the region to the eastward of the Bolor and to the north-westward from *Lake Victoria*.

I again say that it would be the height of temerity to assert that the problem is solved, and that the geography of the Bolor has been cleared up. A great many changes will have to be made on the map of the Pamir before we can arrive at a correct knowledge of this upland plain, but even a more intimate acquaintance with it would hardly change the principal data embodied in the accompanying map. It is not probable that anybody will doubt the existence of lakes Kara-kul, Rian-kul, Dzarik-kul and Sarykul (Victoria Lake), of the river Bolor as the northern source of the Oxus, and of the Sharud as the Badakhshan branch. It must also be presumed that nobody will venture to assert that the Pamir of Wood is only a southern extremity of that plateau, the extent of which is estimated by Son-yun at 1000 li. Nor will anybody entertain doubts as to the accuracy of Klaproth's map founded on the surveys of Tsian-Lun, in which the positions of Kara-kul and Rian-kul appear as on our maps, and lastly it is hardly possible that anybody would not separate the Kazy-yurt and Boroldai ranges from the Bolor system and class them under the ramifications of the Tian-Shan. The geographer who loves truth should be cautious in his conclusions, but such caution should not exclude confidence in the results which are deducible from undoubted sources.

I shall now venture to make a few observations respecting the social condition of the mountainous region of the Upper Oxus, so celebrated since the days of Alexander, and with regard to the Oxus generally. Strictly speaking, such remarks should not find place in a paper of a purely topographical nature, but they involuntarily suggest themselves here to the mind.

To the Imperial Geographical Society, who hold the memory of Mr. P. Golubkof* in great esteem, my remarks may appear bold and not very patriotic, but I shall nevertheless offer them.

If we take Wood's Victoria Lake as the commencement of the Oxus, the whole length of the river to the Sea of Aral will then extend over 1120 geographical miles. Among European rivers it approaches in dimensions nearest the Dnieper. But the basins

* Mr. Golubkof was the organiser of a Russian Trading Company with Central Asia; he was also a zealous promoter of the interests of Russian trade in Central Asia generally, and devoted much time and money to that object. The Company, after languishing for a short time, ceased to exist on the death of its originator.—*Note of M. Veniukof.*

of the Dnieper and the Oxus differ materially in size, natural conditions and historical signification. We must first observe that the Dnieper waters plains along the whole extent of its course, which are subjected to great atmospherical moisture, and therefore rich in vegetation. No mountains occur throughout its flat watershed, with the exception of some inconsiderable heights near the rapids. The Oxus, on the contrary, flows either through sultry, dry and consequently barren steppes, or through a mountainous region where the beds of its branches are strewn with rocks, and the valleys bordered by precipitous and rugged heights. Of its three* principal affluents, the Sharud of Badakhshan alone waters localities celebrated for the richness of their flora. Burnes says that both natives and strangers speak in raptures of this country—of its rivulets, picturesque valleys, fruits, flowers and nightingales. But neither the valleys of the Bolor nor the banks of the upper course of the Duvan, visited by Wood, present any advantages for a sedentary life. On the contrary, these valleys, which are deep and narrow indentations in the surface of a high table-land, have the stern characteristics of alpine localities. Lake Sary-kul, notwithstanding that it is situated in the 37th parallel, continues to be covered with ice in the month of February. The glens of the Bolor Mountains are inhabited by a half wild race of people, who, being separated from each other by the mountainous character of the country, do not fuse into large well-organised communities, but retain the habits of wandering marauders and exist on the plunder of caravans. Without stopping to examine at what point of this upland region the little-known Belors are superseded by Pamir Kirghizes or Buruts, it may be observed that the imagination of the eastern people has not without some foundation peopled the Bolor range with troglodytes or barbarian races. Huen-tsan in the seventh century of the Christian era states that the inhabitants of the upper sources of the Oxus are devoid of all courtesy and justice, prone to violence and hideous in appearance. It is noteworthy that this Buddhist missionary describes them as having blue eyes—an uncommon feature in Turkish and other races on the east and west. Whether the Belors and the Kaffir Siahpushis of Burnes are one and the same tribe, or distinct offshoots of the Indo-Persian race must remain a matter of conjecture, as no positive conclusion can be arrived at. It is, however, plain that the extensive region from the Hindu-Kush to Rian-kul, and from Kunduz to Hissar, to the eastward of the Bolor range, is inhabited by tribes which, from the physical nature of their country, their development and state of civilization, are not destined to play an important and independent part in

* Vide Addenda, V.

history. Although some of these tribes did at one time offer a stout resistance to the conquests of Alexander, and formed part of the kingdom of Bactria, founded by the Macedonians, still in the present day it is difficult to conceive the possibility of a well-organised and homogeneous state being founded in this region. When we moreover remember that this basin of the sources of the Oxus is closed in on the north, east and south by mountains from 15,000 to 18,000 feet high, and across which the roads for pack-animals are few and difficult to traverse, we must arrive at the conclusion that all idea of converting this region into a rich *entrepôt* for a trade with India must be abandoned.

The same mournful conviction impresses itself on our minds when we glance at the course of the Oxus beyond the southern confines of Badakhshan, Vokhan, Karatigen and beyond Termez and Balkh. Commencing from the first of these two latter points as far as Pitniak, the first town of the Oasis of Kharesm, and a distance of about 540 miles, the settled population, as it is well known, keeps aloof from the sultry valley of the Jihoon. The banks of the river along the whole of this extent are occupied by small towns and villages which occur near ferries or at the intersections of caravan-routes. Hence, although the river, as at Chardjui, has a breadth of 235 fathoms, and a depth of 4 fathoms, there is but little chance of its ever becoming a great highway to India from Europe. When we also consider that the shores of the Sea of Aral are so barren as to have defied all the attempts hitherto made at founding even a small settlement on them, that the Aral itself is separated from Russia by intervening steppes 530 miles broad, and lastly seeing the utter impossibility of modifying the characteristics of the nomad marauders, we shall be justified in asserting that even in the remote future the Oxus can only be a secondary channel for the advance of industry and civilisation. It is difficult to surmise whether civilisation will penetrate to its sources—the prolific birthplace of metals and precious stones—from the north-west, from the Aral or from the south over the Hindu-Kush. I, myself, am rather inclined to think, and I hope my opinion will not mortify the patriotism of my fellow members, that its advent must be expected from the latter quarter.

NOTES AND ADDENDA.

I SHALL here direct attention to some of those points of the geography of the Bolor which still remain doubtful, or respecting which we possess contradictory accounts.

I. It may firstly be asked, Where is the southern extremity of the Bolor? Without going so far as to place the limit of this range at Tutukan-Mutkhani